What is claimed is:

1. A method of imaging an object, comprising:

   illuminating said object to emit at least one pulse of electrons;

   directing said pulse of electrons along an optical path through a lens, towards a target to form an image of said object at said target;

   spatially separating electrons within said pulse in dependence on their kinetic energies, before said electrons reach said lens;

   providing a time varying electric field along said optical path remote from said object, said field varying in time so that the amount of energy provided to individual ones of said electrons in said pulse depends on their spatial separation within said pulse, thereby reducing energy dispersion in said pulse at said lens and reducing the chromatic aberration in said image.

2. The method of claim 1, wherein said providing comprises varying an electric potential at said lens.

3. The method of claim 2, wherein said varying an electric potential comprises varying said electric potential to increase in time, in synchronism with said pulse.

4. The method of claim 3, wherein said lens comprises a projector lens.

5. The method of claim 3, wherein said lens comprises a magnetic lens.

6. The method of claim 3, wherein said target comprises an electron detector.

7. The method of claim 3, further comprising providing an objective lens proximate said object to magnify said image.

8. The method of claim 3, wherein said spatially separating comprises passing said pulse of electrons through a drift chamber positioned between said object and said target.

9. The method of claim 8, wherein the electric field in said drift chamber is substantially zero along said optical axis.

10. The method of claim 9, wherein said drift chamber has a length between 20 and 100 cm along said optical axis.

11. The method of claim 3, wherein said pulse of electrons proximate said object has a length less than 10 ns.

12. An apparatus for imaging an object, comprising:

a lens for focusing pulsed electrons emitted from said object and directed along an optical axis to form an image of said object at a target, and

a correcting element positioned remote from said object, said correcting element electrically biased to a voltage for correcting the kinetic energies of electrons passing through said lens, said voltage variable in synchronization with said pulsed electrons for correcting the kinetic energies of said pulsed electrons in dependence on arrival times at said correcting element.

13. The apparatus of claim 12, further comprising a drift chamber positioned upstream of said lens and said correcting element for allowing said pulsed electrons to drift so that said pulsed electrons travelling at different speeds become spatially separated in a direction along said optical axis within said drift chamber.

14. The apparatus of claim 13, further comprising a source for energizing said object to emit said pulsed electrons.

15. The apparatus of claim 14, wherein said source is a radiation source.

16. The apparatus of claim 13, wherein said lens comprises a projector lens.

17. The apparatus of claim 13, wherein said lens comprises a magnetic lens.

18. The apparatus of claim 13, further comprising an electron detector at said target.

19. The apparatus of claim 13, further comprising an electron spectrometer at said target.

20. The apparatus of claim 16, further comprising an objective lens proximate said object.

21. The apparatus of claim 20, further comprising said drift chamber is positioned between said objective lens and one of said one or more projector lenses.

22. The apparatus of claim 21, wherein the electric field in said drift chamber is substantially zero in said direction of said optical axis.

23. The apparatus of claim 22, wherein the length of said drift chamber in said direction of said optical axis is between 20 and 100 cm.

24. The apparatus of claim 13, wherein said correcting element is positioned between said drift chamber and said detector.

25. The apparatus of claim 13, wherein said correcting element is positioned at said focusing element.

26. The apparatus of claim 13, wherein said correcting element is positioned between said drift chamber and said focusing element.

27. The apparatus of claim 13, wherein said correcting element is integrated with said focusing element.

28. The apparatus of claim 20, wherein said objective lens has an opening between 0.05 to 0.2 mm for allowing said pulsed electrons to pass through.

29. A method of imaging an object, comprising:

illuminating said object to emit at least one pulse of electrons;

directing said pulse of electrons along an optical path through a lens, towards a target to form an image of said object at said target;

spatially separating electrons within said pulse in dependence on their kinetic energies, before said electrons reach said lens;

varying the focal strength of said lens in time to compensate for variations in kinetic energies of individual ones of said electrons in said pulse, thereby reducing the chromatic aberration in said image.

30. The method of claim 29, wherein said varying comprises varying an electric potential at said lens.

31. An electric/magnetic lens for use in an electron emission microscope, comprising:

an electrode, having a controllable potential for varying energy imparted to electrons arriving at said electrode, and thereby the focal strength of said lens.